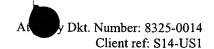
CLAIMS

What is claimed is:

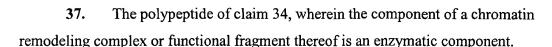
- A method for modifying a region of interest in cellular chromatin, the 1. method comprising the step of contacting the cellular chromatin with a fusion molecule that binds to a binding site in the region of interest, wherein the fusion molecule comprises a DNA binding domain and a component of a chromatin remodeling complex or functional fragment thereof thereby modifying the region of interest.
- 2. The method of claim 1, wherein the cellular chromatin is present in a plant cell.
- 10 3. The method of claim 1, wherein the cellular chromatin is present in an animal cell.
 - 4. The method of claim 3, wherein the cell is a human cell.
 - 5. The method of any of claim 1, wherein the fusion molecule is a fusion polypeptide.
 - 6. The method of claim 1, wherein the DNA-binding domain comprises a zinc finger DNA-binding domain.
 - 7. The method of claim 1, wherein the DNA-binding domain is a triplexforming nucleic acid or a minor groove binder.
- 8. The method of claim 1, wherein the component of a chromatin remodeling 20 complex or functional fragment thereof is an enzymatic component.
 - The method of claim 1, wherein the component of a chromatin remodeling 9. complex or functional fragment thereof is a non-enzymatic component.
 - 10. The method of claim 1, wherein chromatin modification facilitates detection of a sequence of interest.
- 25 The method of claim 10, wherein the sequence of interest comprises a 11. single nucleotide polymorphism.
 - 12. The method of claim 1, wherein chromatin modification facilitates activation of a gene of interest.



- 13. The method of claim 1, wherein chromatin modification facilitates repression of a gene of interest.
- 14. The method of claim 1, wherein chromatin modification facilitates recombination between an exogenous nucleic acid and cellular chromatin.
- The method of claim 5, wherein the method further comprises the step of contacting a cell with a polynucleotide encoding the fusion polypeptide, wherein the fusion polypeptide is expressed in the cell.
 - 16. The method of claim 1, further comprising the step of identifying an accessible region in the cellular chromatin, wherein the fusion molecule binds to a target site in the accessible region.
 - 17. The method of claim 1, wherein the region of interest comprises a gene.
 - **18.** The method of claim 17, wherein the gene encodes a product selected from the group consisting of vascular endothelial growth factor, erythropoietin, androgen receptor, PPAR-γ2, p16, p53, pRb, dystrophin and e-cadherin.
 - 19. The method of claim 1, further comprising the step of contacting the cellular chromatin with a second molecule.
 - **20.** The method of claim 19, wherein the second molecule is a transcriptional regulatory protein.
- 21. The method of claim 19, wherein the second molecule is a fusion 20 molecule.
 - 22. The method of claim 21, wherein the second molecule is a fusion polypeptide.
 - 23. The method of claim 21, wherein the second molecule comprises a zinc finger DNA-binding domain.
- 25 **24.** The method of claim 23, wherein the second molecule further comprises a transcriptional activation domain.
 - 25. The method of claim 23, wherein the second molecule further comprises a transcriptional repression domain.

- 26. The method of claim 23, wherein the second molecule further comprises a polypeptide sequence selected from the group consisting of a histone acetyl transferase, a histone deacetylase, a functional fragment of a histone acetyl transferase, and a functional fragment of a histone deacetylase.
- 27. The method of claim 19, further comprising the step of contacting the cellular chromatin with a third molecule.
 - 28. The method of claim 27, wherein the third molecule is a transcriptional regulatory protein.
 - 29. The method of claim 27, wherein the third molecule is a fusion molecule.
- 10 30. The method of claim 29, wherein the third molecule is a fusion polypeptide.
 - 31. The method of claim 29, wherein the third molecule comprises a zinc finger DNA-binding domain.
 - 32. The method of claim 31, wherein the third molecule further comprises a transcriptional activation domain.
 - 33. The method of claim 31, wherein the third molecule further comprises a transcriptional repression domain.
 - 34. A fusion polypeptide comprising:
 - a) a DNA binding domain; and
- 20 b) a component of a chromatin remodeling complex or a functional fragment thereof.
 - 35. The polypeptide of claim 34, wherein the DNA-binding domain is a zinc finger DNA binding domain.
- 36. The polypeptide of claim 34, wherein the DNA binding domain binds to a 25 target site in a gene encoding a product selected from the group consisting of vascular endothelial growth factor, erythropoietin, androgen receptor, PPAR-y2, p16, p53, pRb, dystrophin and e-cadherin.

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- 38. The polypeptide of claim 34, wherein the component of a chromatin remodeling complex or functional fragment thereof is a non-enzymatic component.
- 39. The polypeptide of claim 37, wherein the enzymatic component of a chromatin remodeling complex or functional fragment thereof is selected from the group consisting of a SWI/SNF complex family member, an Mi-2 complex family member, an ISWI complex family member, a BRM family member, a BRG/BAF complex family member, a Mot-1 complex family member, a Chd-1 family member, a Chd-2 family member, a Chd-3 family member, a Chd-4 family member, a histone acetyl transferase and a histone deacetylase.
 - 40. A polynucleotide encoding the fusion polypeptide of claim 34.
 - 41. A cell comprising the fusion polypeptide of claim 34.
 - 42. A cell comprising the polynucleotide of claim 40.
 - 43. A method for modulating expression of a gene, the method comprising the steps of:
 - a) contacting cellular chromatin with a first fusion molecule that binds to a binding site in cellular chromatin, wherein the binding site is in the gene and wherein the first fusion molecule comprises a DNA-binding domain and a component of a chromatin remodeling complex or functional fragment thereof; and
 - b) further contacting the cellular chromatin with a second molecule that binds to a target site in the gene and modulates expression of the gene.
 - 44. The method of claim 43, wherein modulation comprises activation of expression of the gene.
- 25 45. The method of claim 43, wherein modulation comprises repression of expression of the gene.
 - 46. The method of claim 43 wherein the DNA-binding domain of the first fusion molecule comprises a zinc finger DNA-binding domain.

- 47. The method of claim 43 wherein the second molecule is a polypeptide.
- 48. The method of claim 47 wherein the second molecule comprises a zinc finger DNA-binding domain.
- 49. The method of claim 48, wherein the second molecule further comprises 5 an activation domain.
 - 50. The method of claim 48, wherein the second molecule further comprises a repression domain.
 - 51. The method of claim 43 wherein the second molecule is a transcription factor.
- 10 52. The method of claim 51 wherein the transcription factor is an exogenous molecule.
 - 53. The method of claim 51 wherein the transcription factor is an endogenous molecule.
 - 54. The method of claim 43 wherein the first fusion molecule and the second molecule each comprise a zinc finger DNA-binding domain.
 - 55. The method of claim 43 wherein a plurality of first fusion molecules is contacted with cellular chromatin, wherein each of the first fusion molecules binds to a distinct binding site.
- The method of claim 43, wherein a plurality of second molecules is 56. 20 contacted with cellular chromatin, wherein each of the second molecules binds to a distinct target site.
 - 57. The method of claim 55 wherein at least one of the first fusion molecules comprises a zinc finger DNA-binding domain.
- **58.** The method of claim 56 wherein at least one of the second molecules 25 comprises a zinc finger DNA-binding domain.
 - The method of claim 43 wherein the expression of a plurality of genes is 59. modulated.

- 60. The method of claim 59 wherein a plurality of first fusion molecules is contacted with cellular chromatin, wherein each of the first fusion molecules binds to a distinct binding site.
- 61. The method of claim 60 wherein at least one of the first fusion molecules5 is a zinc finger fusion polypeptide.
 - 62. The method of claim 59, wherein a plurality of second molecules is contacted with cellular chromatin, wherein each of the second molecules binds to a distinct binding site.
- 63. The method of claim 62 wherein at least one of the second molecules is a zinc finger fusion polypeptide.
 - 64. The method of claim 59 wherein the first fusion molecule binds to a shared binding site in two or more of the plurality of genes.
 - 65. The method of claim 64 wherein the first fusion molecule is a zinc finger fusion polypeptide.
- 15 66. The method of claim 59 wherein the second molecule binds to a shared target site in two or more of the plurality of genes.
 - 67. The method of claim 66 wherein the second molecule is a zinc finger fusion polypeptide.
- 68. The method of claim 1, wherein chromatin modification results in the generation of an accessible region in the cellular chromatin.
 - 69. The method of claim 68, wherein generation of the accessible region facilitates binding of an exogenous molecule.
 - 70. The method of claim 69, wherein the exogenous molecule is selected from the group consisting of polypeptides, nucleic acids, small molecule therapeutics, minor groove binders, major groove binders and intercalators.
 - 71. A method for producing a fusion polypeptide, wherein the fusion polypeptide comprises a zinc finger DNA binding domain and a component of a

A Dkt. Number: 8325-0014 Client ref: S14-US1

chromatin remodeling complex or a functional fragment thereof, the method comprising the step of expressing the polynucleotide of claim 40 in a suitable host cell.

- 72. A method for binding an exogenous molecule to a binding site, wherein the binding site is located within a region of interest in cellular chromatin, wherein the method comprises:
- (a) contacting cellular chromatin with a fusion molecule that binds to a binding site in the region of interest, wherein the fusion molecule comprises a DNA binding domain and a component of a chromatin remodeling complex or functional fragment thereof, thereby modifying cellular chromatin within the region of interest; and
- 10 (b) introducing the exogenous molecule into the cell; whereby the exogenous molecule binds to the binding site.